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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,901	11/13/2003	Toru Hirohata	046124-5250	6105
9629	7590	11/01/2004	EXAMINER	
MORGAN LEWIS & BOCKIUS LLP 1111 PENNSYLVANIA AVENUE NW WASHINGTON, DC 20004			NGUYEN, JOSEPH H	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/705,901	Applicant(s) HIROHATA ET AL.	
	Examiner Joseph Nguyen	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-8 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION***Election/Restriction***

This application contains claims directed to the following patentably distinct species of the claimed invention:

Species I: Claim 1 directed to a minimum interval $2L$ between parts of said third semiconductor layer, facing each other while sandwiching the exposed part in the surface of the second semiconductor layer being $0.2\text{ }\mu\text{m}$ or more but $2\text{ }\mu\text{m}$ or less.

Species II: Claim 2 directed to the value of V of the voltage applied between said surface electrode and said backside electrode divided by a minimum interval $2L$ between parts of said third semiconductor layer, facing each other while sandwiching the exposed part in the surface of said second semiconductor layer being $2\text{ (V}/\mu\text{m)}$ or more.

Species III: Claim 3 directed to a thickness of said second semiconductor layer being $D\text{ (m)}$, a minimum interval between parts of said third semiconductor layer, facing each other while sandwiching the exposed part in the surface of said second semiconductor layer being $2L\text{ (m)}$, a carrier density of said second semiconductor layer being $N\text{ (m}^3\text{)}$, and the voltage applied between said surface electrode and said backside electrode being $V\text{ (V)}$, said photocathode satisfying the following relationship $D^2 + L^2 \leq 3.0 (1+V) * 10^9 / N$.

Species IV: Claim 4 directed to a thickness of said second semiconductor layer being $D\text{ (m)}$, a minimum interval between parts of said third semiconductor layer, facing

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each other while sandwiching the exposed part in the surface of said second semiconductor layer being $2L$ (m), and the voltage applied between said surface electrode and said backside electrode being V (V), said photocathode satisfying the following relationship: $D^2 + L^2 \leq 6.0 (1+V) * 10^9 /N$.

Species V: Claim 5 directed to a minimum interval between parts of said third semiconductor layer, facing each other while sandwiching the exposed part in the surface of said second semiconductor layer being $2L$ (m), a carrier density of said second semiconductor layer being N (m^3), and the voltage applied between said surface electrode and said backside electrode being V (V), said photocathode satisfying the following relationship: $L^2 \leq 3.0 (1+V) * 10^9 /N$.

Species VI: claim 6 directed to a minimum interval between parts of said third semiconductor layer, facing each other while sandwiching the exposed part in the surface of said second semiconductor layer being $2L$ (m), and the voltage applied between said surface electrode and said backside electrode being V (V), said photocathode satisfying the following relationship: $L^2 \leq 6.0 (1+V) * 10^{-13}$.

Species VII: claim 7 directed to a thickness of said second semiconductor layer being D (m), a minimum interval between parts of said third semiconductor layer, facing each other while sandwiching the exposed part in the surface of said second semiconductor layer being $2L$ (m), a carrier density of said second semiconductor layer being N (m^3), said photocathode satisfying the following relationship: $D^2 + L^2 \leq 3.3 * 10^9 /N$.

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Species VIII: claim 8 directed to a thickness of said second semiconductor layer being D (m), a minimum interval between parts of said third semiconductor layer, facing each other while sandwiching the exposed part in the surface of said second semiconductor layer being $2L$ (m), a carrier density of said second semiconductor layer being N (m^{-3}), said photocathode satisfying the following relationship: $D^2 + L^2 \leq 6.6 * 10^{-12}$.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, there is no generic claim.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the

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case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

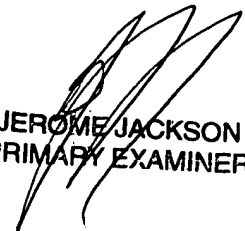
Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (703) 308-1269. The examiner can normally be reached on Monday-Friday, 7:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is (703)-308-7382 for regular communications.

JN
October 28, 2004


JEROME JACKSON
PRIMARY EXAMINER